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Before the

FEDERAL COMMUNICATIONS COMMISSION

FCC 95-500

Washington, D.C. 20554

In the Matter of)
)
Amendment of the Commission's) ET Docket No. 95-183
Rules Regarding the 37.0-38.6 GHz and) RM-8553
38.6-40.0 GHz Bands)
)
Implementation of Section 309(j) of the)
Communications Act -- Competitive) PP Docket No. 93-253
Bidding, 37.0-38.6 GHz and 38.6-40.0 GHz)

NOTICE OF PROPOSED RULE MAKING
AND
ORDER

Adopted: December 15, 1995

; Released: December 15, 1995

Comment Date: January 16, 1996

Reply Comment Date: January 31, 1996

By the Commission: Chairman Hundt dissenting in part and issuing a statement;
Commissioner Barrett issuing a statement; Commissioner Ness dissenting in part and issuing a
statement; Commissioner Chong issuing a statement.

TABLE OF CONTENTS

	Para.
I. INTRODUCTION	1-2
II. BACKGROUND	3-9
III. DISCUSSION	10-124
A. Need for Additional Spectrum	10-15
B. Channeling Plan	16-20
C. Service Areas	21-24
D. Licensing Method	25-28
E. Competitive Bidding Issues	29-95
F. Eligibility, License Transfer, Buildout and License Term	96-98
G. Long Form Application and Regulatory Status	99-101
H. Alternative Licensing Proposal	102-103

I. Revision of the Licensing Rules for the 39 GHz Band	104-111
J. Spectrum Cap	112
K. Technical Rules	113-119
L. Government Coordination	120
M. Interim 39 GHz Licensing Policy	121-124
IV. ORDERING CLAUSE	125
V. PROCEDURAL MATTERS	126-132
Proposed Rules	Appendix A
Initial Regulatory Flexibility Analysis	Appendix B

I. INTRODUCTION

1. By this action, we propose to amend Parts 1, 2, 21 and 94 of our rules to provide a channeling plan and licensing and technical rules for fixed point-to-point microwave operations in the 37.0-38.6 GHz (37 GHz) band.¹ Adoption of this proposal would make the band available for point-to-point microwave operations that would provide communications infrastructure such as "backhaul" and "backbone" communications links for services including broadband personal communications services (broadband PCS), cellular radio, and other commercial and private mobile radio operations.² We observe that such infrastructure could also facilitate the development of competitive wireless local telephone service. Further, we propose a channeling plan based on 50 MHz channel blocks, service areas based on Basic Trading Areas (BTAs), licensing by competitive bidding if mutually exclusive applications are filed, and a minimal number of technical rules designed to limit interference.³ In response to

¹ In a separate rule making, we proposed to consolidate the Parts 21 and 94 service rules for fixed microwave operations into a new Part 101. See Reorganization and Revision of Parts 1, 2, 21, and 94 of the Rules to Establish a New Part 101 Governing Terrestrial Microwave Fixed Radio Services, Notice of Proposed Rule Making, WT Docket No. 94-148, 10 FCC Rcd 2508 (1995). If the proposals in WT Docket No. 94-148 are adopted, we will merge any rules adopted in this proceeding into Part 101 consistent with the rules adopted in that proceeding.

² "Backhaul" links generally are used to interconnect a cell site with a mobile switching office and "backbone" links interconnect mobile switching offices with one another or with a central office.

³ BTAs are defined in the Rand McNally 1992 Commercial Atlas & Marketing Guide, 123rd Edition, pages 36-39. There are 487 BTAs as defined by Rand McNally. In PCS, we separately license the following six additional BTA-like areas: (1) American Samoa; (2) Guam; (3) Northern Mariana Islands; (4) Mayagüez/Aguadilla-Ponce, Puerto Rico; (5) San

a request from the National Telecommunications and Information Administration (NTIA), we solicit comment on additionally allocating the 37-38 GHz band to the space research (space-to-Earth) service.

2. In addition, we propose to amend the licensing and technical rules for fixed point-to-point microwave operations in the 38.6-40.0 GHz (39 GHz) band. Specifically, we propose that the unlicensed areas be licensed using BTA service areas and that auctions be employed should mutually exclusive applications be filed. In order to accommodate incumbent operations, we propose that licensees of rectangular service areas be given eighteen months from the adoption of a Report and Order in this proceeding to file with the Commission a certification that they have constructed a minimum average of four permanently installed and operating links per hundred square kilometers (approximately one link per ten square miles) of their licensed service area for each licensed channel block. Further, licensees with more than one channel block must certify that each channel block contains at least four permanently installed and operating links per hundred square kilometers that can not be reaccommodated in another channel block. If a licensee meets these threshold construction and filing requirements, then the licensee would retain its entire rectangular service area. However, if a licensee does not meet these requirements, then the license would be automatically canceled nineteen months from the adoption of a Report and Order in this proceeding. Further, licensees of rectangular service areas not meeting the above construction threshold must file a list of permanently installed and operating links that they wish to have grandfathered no later than eighteen months from the adoption of a Report and Order in this proceeding. The Commission would then relicense qualifying links individually. Failure to file timely a list of installed and operating links would result in automatic cancellation of the respective licenses. We also propose to modify the technical rules for the 39 GHz band to make them consistent with the technical rules we are proposing for the 37 GHz band. In anticipation of these rule revisions, on November 13, 1995, the Commission's Wireless Telecommunications Bureau released an Order (DA 95-2341) freezing the acceptance for filing of new applications for 39 GHz frequency assignments. In addition, we order that those pending applications that are subject to mutual exclusivity or that were put on public notice after September 13, 1995, shall not be processed pending the outcome of this proceeding.

Juan, Puerto Rico; and (6) the United States Virgin Islands. Thus, if we license this support spectrum using the same BTA service areas employed in PCS, there will be 493 BTA licenses for each frequency block. For a listing of the counties that comprise each BTA service area employed in PCS, see Public Notice, Report No. CW-94-02, released September 22, 1994. See also ¶ 23 for a discussion of copyright issues that must be resolved in this service.

II. BACKGROUND

3. The 37 GHz band is allocated to the fixed and mobile services on a co-primary basis for both Government and non-Government operations.⁴ We have not adopted service rules for this band, and therefore there are no non-Government incumbent operations in this band. There are a few incumbent Government fixed operations in this band.⁵

4. We have adopted a channeling plan and service rules for the adjacent 39 GHz band and this band is now used to support point-to-point communications.⁶ The 39 GHz band is channelized into fourteen 50 MHz pairs, with a 700 megahertz separation between transmit and receive channels. These channels are assigned for use within a rectangular service area that is described in the license application as bounded by maximum and minimum latitudes and longitudes. Licensees have complete flexibility to subdivide and reuse their channels within their service areas without further authorization from the Commission.

5. In the broadband PCS proceeding, we found that broadband PCS will provide a broad range of benefits and services and will be of vital importance to American business and consumers.⁷ Accordingly, we allocated 120 megahertz of spectrum for the licensed broadband PCS service. In that proceeding we declined to allocate additional spectrum for broadband PCS support operations because we believed that the spectrum already allocated for fixed microwave services was adequate for this purpose.⁸ We also noted that some of these support operations can be provided through facilities that do not require use of radio spectrum, such as fiber optic cable. Nevertheless, we stated that if it later appears that the lack of dedicated spectrum or of additional standards such as channelization impedes the development of broadband PCS, we would revisit this issue.⁹

⁴ See 47 C.F.R. § 2.106.

⁵ There are a total of nine NTIA authorized fixed links at two government installations in this band.

⁶ See 47 C.F.R. § 21.701(j).

⁷ See Amendment of the Commission's Rules to Establish New Personal Communications Services, GEN Docket No. 90-314, Memorandum Opinion and Order, 9 FCC Rcd 4957, 4959-4960 (1994) (Broadband PCS Memorandum Opinion and Order).

⁸ See Broadband PCS Second Report and Order, 8 FCC Rcd 7700, 7740-7741 (¶¶ 93-96) (1993).

⁹ Id. at ¶ 96; see also Broadband PCS Memorandum Opinion and Order, 9 FCC Rcd at 4971 n. 26.

6. On September 9, 1994, the Fixed Point-to-Point Microwave Section of the Telecommunications Industry Association (TIA) filed a Petition for Rulemaking proposing a channeling plan and technical rules for the 37 GHz band so that this spectrum would be available for broadband PCS operators, cellular operators and other common carriers and private operators in order to satisfy point-to-point communications needs.¹⁰ TIA proposes a channeling plan with fourteen 50 MHz channel pairs separated by 700 megahertz for point-to-point operations, and four unpaired 50 MHz channels for one-way fixed and mobile operations, including broadcast and cable auxiliary operations. TIA further suggests that we consider granting licenses for service areas defined by Basic Trading Areas (BTAs). TIA also requests that we adopt technical standards for the 37 GHz band and modify the existing standards governing point-to-point operations in the 39 GHz band as follows: require transmitters to operate with a frequency tolerance of 0.001%; permit only Category A antennas;¹¹ authorize a transmitter power limit of 10 watts; and limit the equivalent isotropically radiated power (EIRP) to 50 dBW.¹² Finally, TIA suggests that we adopt rules that clarify when a licensee may apply for additional channels. Comments supporting TIA's petition were filed by Pacific Bell Mobile Services (Pacific Bell) and Microwave Radio Corporation (MRC). No opposing or reply comments were filed.

7. A substantial and growing number of applications to use the 39 GHz band were filed after the adoption of the Broadband PCS Second Report and Order, many of which requested authorization of several 50 MHz channel pairs in various metropolitan areas. The staff has concluded that many of these applications were submitted to obtain spectrum to be used in support of broadband PCS operations and that some of these applications may have been filed by speculators looking only for windfall profits in an aftermarket. Accordingly, the Commission's Common Carrier Bureau issued a Public Notice on September 16, 1994, elaborating on the showings required by our current rules.¹³

¹⁰ See Petition for Rulemaking filed by the Fixed Point-to-Point Microwave Section of the Telecommunications Industry Association on September 9, 1994. See also Public Notice, Report No. 2044, released December 1, 1994, which established RM-8553. On May 4, 1995, TIA amended its petition modifying its proposed channeling, service area, and licensing plans. See infra ¶ 9.

¹¹ Category A antenna standards are defined in Section 21.108 of the Commission Rules. See 47 C.F.R. § 21.108. Category A antennas provide a more focused antenna pattern than Category B antennas, allowing for greater frequency reuse.

¹² EIRP is defined in the Commission's Rules at 47 C.F.R. § 21.2.

¹³ See Public Notice, Mimeo No. 44787, released September 16, 1994. This public notice was prompted by an increase in the filing of 39 GHz applications. The public notice described showings required in applications for 39 GHz facilities. Pursuant to that notice, applicants are required to show that they have considered non-RF solutions and have a clear and present need for the channel, and to fully disclose the real party (or parties) in interest.

8. On March 21, 1995, NTIA informed us that it had reviewed TIA's petition.¹⁴ NTIA noted that the United States proposed and obtained additional space service allocations in the 37-40.5 GHz portion of the spectrum at the 1992 World Administrative Radio Conference (WARC-92).¹⁵ Specifically, the United States obtained a primary worldwide allocation for the space research (space-to-Earth) service¹⁶ in the 37-38 GHz band and a secondary allocation for the earth exploration satellite (space-to-Earth) service in the 37.5-40.0 GHz band.¹⁷ NTIA requests that the space research service be added to the Government allocations on a primary basis in the 37-38 GHz band and also proposes that the space research service be added to the non-Government allocations on a secondary basis in the 37-38 GHz band.

9. On May 4, 1995, TIA filed an amendment to its petition for rulemaking.¹⁸ TIA now suggests that 800 megahertz (37.0-37.4 and 37.7-38.1 GHz) of the band be channelized into 2.5, 5, 10, 20 and 40 MHz paired channels that would be licensed on a link-by-link basis. TIA continues to request that the 37.4-37.7 and 38.1-38.6 GHz portions of the band be channelized into six 50 MHz channel pairs and four 50 MHz unpaired channels that would be licensed using BTAs. Further, TIA requests that the 37 GHz band not be licensed by auction and that the six 50 MHz channel pairs be reserved for broadband PCS, cellular and

Normally, only one frequency or frequency pair per geographic area will be authorized to a single applicant initially. A geographic area will normally not be greater than a 50 mile radius about a specified point. Applications for additional channels will be considered only if an immediate requirement exists for simultaneous communications, frequency re-use is impossible, and all previously authorized frequencies are constructed and are fully loaded to a minimum efficiency of 1 bit per second per hertz.

¹⁴ See Memorandum from William Gamble, Chairman of the Interdepartment Radio Advisory Committee (IRAC), to William Torak, FCC Liaison Representative, IRAC, dated March 21, 1995, placed in RM-8553 on March 30, 1995.

¹⁵ See International Telecommunication Union (ITU) Final Acts of the World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum, (WARC-92), Malaga-Torremolinos, 1992, at 91.

¹⁶ The space research service is defined as a radiocommunication service in which spacecraft or other objects in space are used for scientific or technological research purposes.

¹⁷ WARC-92 also allocated the 40.0-40.5 GHz band to the earth exploration-satellite (Earth-to-space) and space research (Earth-to-space) services on a primary basis and the earth exploration-satellite (space-to-Earth) service on a secondary basis. These allocations are beyond the scope of this proceeding.

¹⁸ See TIA Amendment to Petition for Rulemaking (amendment), filed on May 4, 1995 in RM-8553. TIA served a copy of this amendment on Pacific Bell and MRC.

specialized mobile radio (SMR) licensees until the year 2000. TIA also suggests that a 1 bit per second per hertz (bps/Hz) minimum bit efficiency should be enforced for the 5, 10, 20, and 40 MHz paired channels, except that a 12T1 transmission rate should be permitted in the 20 MHz channels.¹⁹ No party filed comments on the amendment.

III. DISCUSSION

A. Need for Additional Spectrum

10. In its petition as originally filed, TIA states that the 37 GHz band should be channelized to permit broadband PCS, cellular, and other common carrier and private operators to use the band to satisfy point-to-point communications needs. It argues that all of the available channel pairs in the 39 GHz band have already been assigned in major markets. TIA claims that if the 37 GHz band is not made available for licensing in a reasonable time frame, broadband PCS licensees will need to seek separate licenses for each link in other fixed service bands, such as 18 GHz and 23 GHz, to interconnect their cell sites.²⁰ TIA expresses concern that, if it becomes necessary for broadband PCS licensees to obtain separate licenses for each link to every individual cell site, the Commission's administrative processes could be overwhelmed by license applications and the availability of broadband PCS to the public would be significantly delayed. TIA therefore argues that expedited action in this proceeding is necessary so that broadband PCS operators will have adequate spectrum available to them when they begin construction of their systems.

11. TIA states that in addition to the interest demonstrated by broadband PCS licensees, cellular licensees have expressed interest in using the 39 GHz band to interconnect cell sites. It points out that cellular systems have continually increased capacity by adding cell sites placed closer together, which has required that cellular licensees obtain additional point-to-point links to interconnect their cells. It submits that as the distance between cell sites has decreased, the frequency band of choice to interconnect cell sites has shifted from 2 GHz to 18 GHz to 23 GHz. TIA expects that as cell sites continue to move closer together, cellular licensees will show substantial interest in the 39 GHz band. Further, it adds that a new group of local microwave common carriers is evolving to provide "last mile" services (short-haul communication links) to broadband PCS operators and to private companies that might need high-speed broad bandwidth links between offices, and that these new providers also will want to use the 37 GHz band. Therefore, TIA submits that the 39 GHz band will not be adequate to satisfy demand and requests that we channelize the 37 GHz band in the

¹⁹ A T1 rate is 1.544 megabit/second (Mbit/sec). Thus, a 12T1 rate is 18.528 Mbit/sec and this rate, in a 20 MHz channel, produces a bit efficiency of 0.9264 bps/Hz.

²⁰ Unlike the 39 GHz band, where a license is granted for a rectangular service area, licenses in the lower fixed-service bands are granted for specific communication links.

same manner as the 39 GHz band and harmonize the service rules for both bands so that channels throughout the combined 37-40 GHz band may be used seamlessly by broadband PCS and cellular licensees.

12. Pacific Bell and MRC agree with TIA that the 37 GHz band will be needed in addition to the 39 GHz band to provide adequate support spectrum for broadband PCS operations. Pacific Bell and MRC claim that the 37 GHz band will be needed to help create backbone networks for the interconnection of broadband PCS cell sites and for other uses that will assist in the provision of broadband PCS to the public. Pacific Bell argues that the record in the broadband PCS proceeding indicates that public demand for broadband PCS will be significant and that meeting this demand will require timely availability of substantial resources for backbone networks. MRC states that backhaul spectrum is needed to provide an alternative to leased wireline capacity provided by telephone and cable companies and that the 37 GHz band is well-suited for interconnecting broadband PCS cell sites.

13. We continue to believe that broadband PCS will provide a broad range of benefits and services and will be of vital importance to American business and consumers.²¹ Consequently, we believe it important that we provide every opportunity for broadband PCS to develop, including providing adequate spectrum to meet its infrastructure needs. We are concerned, however, that the current demand for spectrum in the 39 GHz band may preclude use of that band to provide adequate support spectrum for broadband PCS and that additional spectrum from the 37 GHz band will be needed to meet this demand. Further, in addition to providing spectrum for broadband PCS infrastructure, it appears that the 37 GHz band may be needed to support cellular and other commercial and private mobile radio operations. Therefore, we believe that the public interest will be served by developing service rules that will permit the use of the 37 GHz band -- in addition to the 39 GHz band -- for point-to-point operations. Accordingly, and consistent with TIA's proposal, we are proposing that the 37 GHz band be made available for use in point-to-point operations, such as those providing broadband PCS and cellular infrastructure links.²² In addition, we propose to amend licensing and technical rules for the 39 GHz band in order to harmonize the rules for the two bands so that the combined 37-40 GHz band is made more suitable for supporting broadband PCS, cellular and other communications services. However, we request comment on whether the 37 GHz band or a portion of it should be made available for a wider array of fixed services, such as point-to-multipoint systems; whether there is a requirement for mobile operations in

²¹ We believe that our commitment to broadband PCS is strongly supported by the competitive bidding results for Blocks A and B, which are 15 MHz channel block pairs licensed on a Major Trading Area (MTA) basis. As a result of the competitive bidding and anticipated pioneer's payment, the U.S. Treasury expects to receive a total of \$7,721,184,171 for the 102 MTA licenses.

²² We are also administratively updating Part 2 in order to be consistent with the Final Acts of WARC-92. See Appendix A.

the 37 GHz band and, if so, whether such operations should be on a co-primary or secondary basis to the point-to-point operations; and whether we have overestimated demand and, thus whether a portion of the band should be held in reserve for future services. If we decide to broaden the permissible use of these bands to include other fixed and/or mobile uses, we would not anticipate separately licensing such uses but rather including them within the uses permitted under our proposed BTA licenses. This would be accomplished by licensing this spectrum under the recently-adopted General Wireless Communications Service (GWCS) rules²³ or the Licensed Millimeter Wave Service (LMWS) rules proposed in ET Docket No. 94-124 (Amendment of Parts 2 and 15 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications), Notice of Proposed Rule Making, 9 FCC Rcd 7078, 7086-7087 (¶¶ 20-22) (1994).

14. We also solicit comment on the NTIA's request that the 37-38 GHz band be allocated to the space research (space-to-Earth) service for Government use on a co-primary basis with the fixed and mobile services. The United States actively sought and achieved an international agreement for this space research allocation at WARC-92, including sharing criteria between space and terrestrial radio communications services in this band.²⁴ Accordingly, we solicit comment on whether Government space research operations will be able to share this band with non-Government point-to-point operations using the sharing

²³ See Allocation of Spectrum Below 5 GHz Transferred from Federal Government Use, 4660-4685 MHz, ET Docket No. 94-32, Second Report and Order, 60 Fed. Reg. 40712 (August 9, 1995) (GWCS Second Report and Order).

²⁴ Those sharing criteria are: The power flux-density at the Earth's surface produced by emissions from a space station in the 31.0-40.5 GHz band, including emissions from a reflecting satellite, for all conditions and for all methods of modulation, shall not exceed the following values:

-115 dB (W/m²) in any 1 MHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;

-115 + 0.5(δ - 5) dB (W/m²) in any 1 MHz band for angles of arrival δ (in degrees) between 5 and 25 degrees above the horizontal plane;

-105 dB (W/m²) in any 1 MHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux-density which should be obtained under assumed free-space propagation conditions. See ITU Radio Regulations, Edition of 1990, Revised in 1994, No. 2578 at RR28-12; see also id. No. 2581 at RR28-13. We note that these are interim limits that apply only until such time as a future world radiocommunication conference endorses final limits; see also id. Nos. 2582.1, 2583, 2584, and 2585.

criteria adopted at WARC-92, whether the band should be restricted exclusively to fixed operations, or whether some spectrum should be reserved solely for Government space research. If the band is shared, we anticipate that license applications would be coordinated and issued between Government space research operations and non-Government point-to-point operations on a first-come, first-served basis and propose to employ our existing rules for such coordination.²⁵

15. In addition to the Government allocation, NTIA requests that we allocate the 37-38 GHz band to the space research (space-to-Earth) service on a secondary basis for non-Government use. We are unaware of any such requirements and therefore are not making such a proposal. However, we solicit comment on whether there are requirements for non-Government space research in this band and, if so, to what extent we should allocate spectrum for this service and what service rules should apply.

B. Channeling Plan

16. In its petition for rulemaking as originally filed, TIA proposed that the 37 GHz band be channelized into fourteen 50 MHz paired channels with a 700 megahertz transmit/receive channel separation,²⁶ and four 50 MHz unpaired channels. It noted that this paired channeling plan would be consistent with that currently used in the 39 GHz band. TIA states that such consistent spacing between transmit and receive channels is important to equipment manufacturers because it would allow for equipment commonality between the bands, thereby resulting in lower equipment costs. Also, TIA states that a need exists for unpaired frequencies that would be available to portable and fixed services for broadband video or digital applications, for one-way point-to-point or portable point-to-point use. TIA argues that its channeling plan would allow existing users of 39 GHz portable microwave radios to continue employing their equipment and also would accommodate one-way users involved in broadband services, such as television, security or wide area network applications.

17. TIA also proposes that the licensee of a channel in the 37 GHz band be allowed to subdivide and reuse its channel virtually without limitation in its service area, as is done in the 39 GHz band. TIA argues that the short propagation distances in this range of the radio spectrum allow a subchannel to be reused many times within a metropolitan area without causing interference. It also proposes that the subchannelization be based on an underlying grid of 1.25 MHz increments, because such a subchanneling plan would ease frequency

²⁵ The administrative aspects of the coordination process are set forth in §§ 21.100(d) and 21.706(c) and (d) in the case of coordination of terrestrial stations with earth stations, and in § 25.203 in the case of coordination of earth stations with terrestrial stations. The technical aspects of the coordination process are set forth in §§ 25.252 through 25.256. See 47 C.F.R. § 25.251.

²⁶ For example, 37.00-37.05 GHz would be paired with 37.70-37.75 GHz.

coordination at channel edges and at geographic boundaries. It states that this plan would permit the use of standardized frequency synthesizers, thereby resulting in lower equipment costs. Further, TIA proposes that licensees be required to subchannelize in a manner that maximizes the capacity of the channel assigned to them and minimizes the likelihood of interference to adjacent channel licensees. Finally, TIA requests that we adopt this same 1.25 MHz grid for subchannelization in the 39 GHz band.

18. In its amendment, TIA revised its channeling plan to include some 2.5 MHz, 5 MHz, 10 MHz, 20 MHz and 40 MHz paired channels in the 37.0-37.4 and 37.7-38.1 GHz portion of the 37 GHz band, but did not suggest a specific channeling plan, *e.g.*, what the proper mix of these channels should be. TIA states that these various channel sizes are required to accommodate the specific needs of private users and to prevent inefficient use of the spectrum by operators that cannot justify the need for a multitude of links. TIA continues to request that the 37.4-37.7 and 38.1-38.6 GHz portions of the band be channelized into six 50 MHz channel pairs and four 50 MHz unpaired channels.

19. We tentatively find that the 50 MHz channeling plan originally proposed by TIA would provide for efficient and effective use of the 37 GHz band for point-to-point operations by broadband PCS, cellular, and other commercial and private mobile radio operations because the commonality of this channeling plan with the channeling plan for 39 GHz will permit manufacturers to provide equipment quickly and to lower equipment costs for both bands. Accordingly, we propose to adopt a channeling plan for the entire 37 GHz band based on 50 MHz channel blocks and a 700 megahertz separation between transmit and receive frequencies, with four unpaired 50 MHz channel blocks, as listed in Appendix A. We believe this is necessary to meet the infrastructure needs of broadband PCS, SMR and cellular licensees. However, we solicit comment on whether there is a need for a channeling plan that would provide for a variety of channel pairs licensable on an individual link basis, as suggested by TIA in its amendment. See ¶ 24, *infra*. We also solicit comment on whether there is a need for the four 50 MHz unpaired channel blocks, as we are proposing, or whether these channel blocks should be made available for additional channel block pairs to meet demand for paired operations. In particular, we observe that a channeling plan based on an 800 megahertz transmit/receive separation, or an interleaved channeling plan that uses either a 200 or 400 megahertz separation, would provide sixteen 50 MHz channel block pairs instead of the fourteen 50 MHz channel block pairs and four 50 MHz unpaired channel blocks that we are proposing. Accordingly, we request comment on whether we should choose any of these alternative approaches rather than the plan proposed.

20. Further, we propose to allow licensees to subdivide their channel blocks in the 37 GHz band as they so choose. We decline to propose subchannels that are restricted to 1.25 MHz increments because we believe that, due to the relatively short propagation distances at these frequencies, the lack of a subchannelization plan is unlikely to cause any significant coordination problems in this band. We anticipate that many of the operations in this band will provide infrastructure links for broadband PCS operations, and we note that

broadband PCS licensees have flexibility to subdivide their channel blocks.²⁷ Therefore, adopting any subchannelization plan in the 37 GHz band may force broadband PCS licensees to use a plan that is inconsistent with their operations in the broadband PCS band.²⁸ We believe that the most flexible and efficient use of this spectrum would come from authorizing licensees to freely subdivide these channel blocks as they see fit. Moreover, we note that the absence of Commission standards in this area does not preclude the voluntary development of industry standards. Nonetheless, we solicit comment on this matter.

C. Service Areas

21. TIA originally recommended that all channels in the 37 GHz band be licensed using BTA service areas. It argued that BTAs are better adapted to the needs for broadband PCS infrastructure than are the rectangular service areas used in licensing the 39 GHz band. However, in its amendment, TIA now proposes that 800 megahertz of the band be channelized into 2.5, 5, 10, 20 and 40 MHz paired channels as addressed above and that this spectrum be licensed on a traditional individual link basis. TIA states that it is essential that private users of short range microwave links be able to own and control their microwave communication infrastructure for reliability reasons. TIA argues that these private users provide critical services to the public and do not generate profits from their communication infrastructure.

22. Complementary to our proposal to channelize the entire band into 50 MHz paired and unpaired channel blocks, we propose to license all the channel blocks using BTA service areas. We are proposing BTA service areas for this frequency band because the service areas adopted in broadband PCS are BTAs and Major Trading Areas (MTAs), which in turn consist of two or more BTAs.²⁹ We believe use of BTAs will provide a more orderly structure for the licensing process than allowing each licensee to define its own service area, as is currently done in the 39 GHz band. Nonetheless, we solicit comment on whether some or all of the channel blocks should be made available for licensing over various and significantly larger geographic areas, such as on MTA, regional and nationwide bases.³⁰ We also seek comment

²⁷ See Broadband PCS Second Report and Order, 8 FCC Rcd 7700, 7755.

²⁸ For example, if a broadband PCS licensee used a 2 MHz subchannelization plan in its broadband PCS spectrum, it may wish to use a consistent channeling plan in its support spectrum, and a 1.25 MHz subchannelization plan would prohibit that.

²⁹ See 47 C.F.R. § 24.202.

³⁰ We observe that with 32 channels, each licensed using the 493 BTAs, there would be 15,776 BTA licenses available in the 37-40 GHz band. If instead we were to generally use larger service areas, for example, 4 BTAs, 10 MTAs, 10 regional (e.g., the 5 regions, each with approximately 20% of the nation's population, which were developed as a service area in the narrowband PCS proceeding), and 8 nationwide licenses, there would only be 2,540

on the use of service areas based on the 172 Economic Areas (EAs) developed by the Department of Commerce's Bureau of Economic Analysis or based on the 349 Component Economic Areas (CEAs) of which the EAs are composed.³¹ We request comment on whether these geographic areas would be appropriate for licensing the 37 GHz and 39 GHz bands or whether other alternative licensing areas would be more appropriate.

23. We note that Rand McNally & Company owns the copyright to the MTA/BTA Listings, which identify the BTAs contained in each MTA and the counties comprising each BTA. This information is also provided in Rand McNally's Trading System MTA/BTA Diskette and is geographically represented in a map contained in Rand McNally's 1992 Commercial Atlas & Marketing Guide. Rand McNally has licensed through an agreement with the Personal Communications Industry Association (PCIA) the use of its copyrighted MTA/BTA Listings and maps for certain services such as PCS and 800 MHz SMR. It is unclear as to whether the licensing agreement covers the intermediate links, which together with the end links enable the delivery of an end-to-end service. We therefore encourage PCIA and Rand McNally to clarify the licensing agreement.

24. With regard to TIA's asserted continuing need for individually licensed links, we propose not to set aside any channels for individually licensed links in the 37 GHz band, but we seek comment on methods available to meet the needs of those who might desire individual links, smaller geographic service areas, or smaller spectrum blocks. For example, should we adopt rules regarding geographic partitioning to allow for smaller geographic service areas?³² Should we allow some form of spectrum disaggregation? Commenters suggesting methods to meet the spectrum needs of private users should address specifically how their proposals would work from an administrative standpoint and how these proposals

licenses available in the 37-40 GHz band, which is a 84% reduction in the number of available licenses. This reduction should enable us to more swiftly license these bands.

³¹ According to the Department of Commerce, each EA "consists of one or more economic nodes -- metropolitan areas or similar areas that serve as centers of economic activity -- and the surrounding counties that are economically related to the nodes. (Metropolitan areas include metropolitan statistical areas (MSAs), primary metropolitan statistical areas (PMSAs), and New England county metropolitan areas (NECMAs).) Commuting patterns are the main factor used in determining the economic relationship among counties. The EA economic areas definition procedure requires that, as far as possible, each area include both the place of work and the place of residence of its labor force." See Final Redefinition of the BEA Economic Areas, 60 Fed. Reg. 13114 (March 10, 1995) (reducing number of EAs from 183 to 172). In addition, we would separately license the following three EA-like areas: (1) Puerto Rico and the United States Virgin Islands; (2) Guam and the Northern Mariana Islands; and (3) American Samoa.

³² See specific proposal at ¶¶ 89-90, infra, regarding geographic partitioning for rural telephone companies.

would comply with requirements in the Communications Act and the Commission's Rules that licensees remain in control of the spectrum they are authorized to use and that any transfer of control must be approved by the Commission. In addition, commenters should address the implications of these arrangements for other proposed rules such as buildout requirements, transfer limitations for small business, and license terms. Alternatively, we request comment on whether these needs for individual microwave links can be met through the purchase of publicly available common carrier offerings by 37 GHz licensees. We also solicit comment on TIA's proposal and whether we should set aside some channels to accommodate individually licensed links, including whether we should adopt a channeling plan with some channel pairs smaller than 50 MHz (i.e., 2.5, 5, 10, 20 and 40 MHz). Further, we solicit comment on whether any channel blocks that may be set aside for individually licensed links should come exclusively from the 39 GHz band.

D. Licensing Method

25. In its petition as originally filed, TIA did not recommend a licensing method for the 37 GHz band. However, in its amendment, TIA requests that the 37 GHz band not be subject to auctions, arguing that auctioning the band would serve no useful purpose and would add unacceptable costs and barriers to legitimate users of the spectrum. We have given careful consideration to but do not agree with TIA's argument, and thus we propose to use competitive bidding to select licensees in the 37 GHz band. Competitive bidding is an extremely efficient method of assuring, with a minimum of regulatory burden, that channels are assigned only to applicants with the greatest need for the spectrum.

26. Section 309(j)(2)(A) of the Communications Act of 1934, as amended (Communications Act), permits competitive bidding to be used if we determine that:

the principal use of such spectrum will involve, or is reasonably likely to involve, the licensee receiving compensation from subscribers in return for which the licensee--

(i) enables those subscribers to receive communications signals that are transmitted utilizing frequencies on which the licensee is licensed to operate; or

(ii) enables those subscribers to transmit directly communications signals utilizing frequencies on which the licensee is licensed to operate....³³

The legislative history of this section shows that Congress intended to authorize competitive bidding for subscriber-based services only, as opposed to non-subscriber based services such as broadcasting.³⁴ In addition to the "principal use" requirement, for competitive bidding to

³³ 47 U.S.C. § 309(j)(2)(A).

³⁴ See H.R. Rep. No. 111, 103d Cong., 1st Sess. 253 (1993), which states in pertinent part: "The enactment of section 309(j) should not affect the manner in which the Commission

be permitted, mutually exclusive applications for initial licenses or construction permits must have been accepted for filing³⁵ and the use of competitive bidding must promote the objectives contained in Section 309(j)(3)(A) through (D) of the Communications Act.

27. In the Competitive Bidding Notice of Proposed Rule Making, we proposed that licenses for frequencies used as intermediate links in the provision of a continuous, end-to-end service to a subscriber would be subject to competitive bidding.³⁶ In that Notice we stated that services such as common carrier point-to-point microwave utilized as part of end-to-end subscriber-based service offerings would fall within the criteria described in Section 309(j)(2)(A)(i) and (ii) because the licensed spectrum is used as an integral part of an end-to-end service offering, enabling paying subscribers either to transmit directly or receive "communications signals utilizing frequencies on which the licensee is licensed to operate." However, in the Second Report and Order in that proceeding, we decided not to auction intermediate links.³⁷ We reasoned that before employing competitive bidding, the Commission is required to determine that mutually exclusive applications are likely to be filed and that such bidding would promote the objectives of Section 309(j)(3)(A) through (D) of the Communications Act. With regard to mutual exclusivity, we noted that in those frequency bands most often utilized as intermediate links, mutual exclusivity is usually avoided by employing a frequency coordination process for each intermediate link prior to the time an application is granted. With regard to the objectives of Section 309(j)(3)(A) through (D), we concluded that auctioning intermediate links could significantly delay the development and rapid deployment of new technologies, products and services for the benefit of the public, that auctions for these links could impose significant administrative costs on licensees and the Commission, and that it was unclear whether competitive bidding for intermediate links would

issues licenses for virtually all private services, including frequencies utilized by Public Safety Services, the Broadcast Auxiliary Service, and for subcarriers and other services where the signal is indivisible from the main channel signal. Similarly, inasmuch as mass media broadcast signals are provided to the general public without the payment of a subscription fee, the current licensing practices of the FCC remain unchanged." See also H.R. Conf. Rep. No. 213, 103d Cong., 1st Sess. 481-82 (1993).

³⁵ See 47 U.S.C. § 309(j)(1).

³⁶ See Implementation of Section 309(j) of the Communications Act - Competitive Bidding, PP Docket No. 93-253, Notice of Proposed Rule Making, 8 FCC Rcd 7635, 7639 (¶ 28) (1993) (Competitive Bidding Notice of Proposed Rule Making).

³⁷ See Implementation of Section 309(j) of the Communications Act - Competitive Bidding, PP Docket No. 93-253, Second Report and Order, 9 FCC Rcd 2348, 2355-2356 (¶ 41) (1994) (Competitive Bidding Second Report and Order).

recover for the public a significant portion of the value of the spectrum, prevent unjust enrichment or promote efficient and intensive use of the spectrum.³⁸

28. Our proposal to use BTA service areas in the 37 GHz band and our subsequent experience in licensing frequencies in the 39 GHz band has caused us to reconsider the decision not to license intermediate links by competitive bidding. First, as we concluded in the Competitive Bidding Notice, point-to-point microwave channels used as part of end-to-end subscriber-based service offerings would meet the criteria set forth in Section 309(j)(2)(A). Therefore, we tentatively conclude that, based on TIA's description of the likely uses of the 37 GHz band by broadband PCS and other carriers, the use of such spectrum will satisfy the "principal use" test in the competitive bidding statute. Second, because BTAs are large areas, we believe that defining service areas by BTAs will likely result in the filing of mutually exclusive applications.³⁹ Third, our experience with auctions in other bands leads us to conclude that an auction for intermediate links within a well defined service area will neither significantly delay the provision of broadband PCS or other services to the public nor impose significant administrative costs on the applicants or the Commission. Fourth, a review of licenses in the 39 GHz band reveals that few channels are now available in most metropolitan areas and, thus, that making more channels available through competitive bidding will likely promote the development and rapid deployment of new technologies, promote economic opportunity and competition, and ensure that new and innovative technologies are readily accessible to the American people. Finally, some of the licensees in the 39 GHz band have offered to sell or lease their licenses to broadband PCS operators. These offers suggest that some of these licensees may not have ever intended to directly serve the public, but rather to hold their own auctions and thereby deprive the public of those revenues. Therefore in sum, we believe that an auction for the 37 GHz band may be desirable. An auction would place licenses in the hands of those who value this spectrum most highly, recover a portion of the value of the spectrum for the public, prevent the award of licenses to speculators and promote efficient use of this spectrum. Consequently, we find that an auction of this spectrum is likely to promote the objectives of Section 309(j)(3)(A) through (D) of the Communications Act. Accordingly, we propose to modify Section 1.2102(b)(4) of our rules to implement this proposal.

³⁸ Id. at ¶ 43.

³⁹ In most point-to-point microwave bands, service is licensed on a link-by-link basis and licensees are required to coordinate and engineer their systems to avoid conflicts with existing and previously proposed systems. In the broadband PCS service, however, we have found that use of large-sized (i.e., MTA and BTA) service areas and appropriate field strength limits renders unnecessary such general prior coordination; instead, informal coordination among broadband PCS systems is needed only near service area borders.

E. Competitive Bidding Issues

29. We have proposed that we will use auctions to issue licenses in the 37 GHz band. Accordingly, we wish to fully explore issues related to competitive bidding.

1. Competitive Bidding Design

a. General Competitive Bidding Rules

30. In the Competitive Bidding Second Report and Order and its progeny, we established the criteria to be used in selecting from among auction methodologies to use for each particular auctionable service and prescribed rules and procedures for general and specific use.⁴⁰ Generally, we concluded that awarding licenses to those parties who value them most highly would foster Congress's policy objectives. We noted there that, since a bidder's ability to introduce valuable new services and to deploy them quickly, intensively, and efficiently increases the value of a license to that bidder, an auction design that awards licenses to those bidders with the greatest willingness to pay tends to promote the development and rapid deployment of new services and the efficient and intensive use of the spectrum. We also found that: (1) licenses with strong value interdependencies should be auctioned simultaneously, and (2) multiple round auctions generally will yield more efficient allocations of licenses and higher revenues by providing bidders with information regarding other bidders' valuations of licenses, especially where there is substantial uncertainty as to value.⁴¹ Thus, we concluded, where the licenses to be auctioned are interdependent and their value is expected to be high, simultaneous multiple round auctions would best achieve the Commission's goals for competitive bidding.⁴²

⁴⁰ Competitive Bidding Second Report and Order, 9 FCC Rcd 2348 (1994); recon. Second Memorandum Opinion and Order, 9 FCC Rcd 7245 (1994) (Competitive Bidding Second Memorandum Opinion and Order); Third Report and Order, 9 FCC Rcd 2941 (1994) (Competitive Bidding Third Report and Order), establishing rules for narrowband PCS; recon. Third Memorandum Opinion and Order and Further Notice of Proposed Rulemaking, 10 FCC Rcd 175 (1994) (Competitive Bidding Third Memorandum Opinion and Order and Further Notice of Proposed Rulemaking); Fourth Report and Order, 9 FCC Rcd 2330 (1994), establishing rules for Interactive Video and Data Service; Fifth Report and Order, 9 FCC Rcd 5532 (1994) (Competitive Bidding Fifth Report and Order), establishing rules for Broadband PCS; recon. Fourth Memorandum Opinion and Order, 9 FCC Rcd 6858 (1994) (Competitive Bidding Fourth Memorandum Opinion and Order).

⁴¹ Competitive Bidding Second Report and Order, 9 FCC Rcd 2348, 2360 (¶ 69).

⁴² Id. at 2366 (¶¶ 109-111).

b. Competitive Bidding Design for the 37 GHz Band

31. Simultaneous Multiple Round Auctions. Based on the factors identified in the Competitive Bidding Second Report and Order and our prior auction experiences, we tentatively conclude that simultaneous multiple round auctions are appropriate for the 37 GHz band. Compared with other bidding mechanisms, simultaneous multiple round bidding will generate the most information about license values during the course of the auction and provide bidders with the most flexibility to pursue back-up strategies. As in the case of PCS,⁴³ the 37 GHz licenses are interdependent, and licensees likely will aggregate and substitute across spectrum blocks and geographic regions. Our experience to date is that simultaneous multiple round bidding is efficient and cost-effective. Additionally, simultaneous multiple round bidding is likely to generate the most information about license values during the course of the auction and facilitate efficient aggregation of licenses across spectrum bands.⁴⁴ We seek comments on this tentative conclusion and on its impact on competitive bidding in the 37 GHz band.

32. Circumstances Leading to Choice of Other Designs. We propose to tailor the auction design to fit the characteristics of the licenses to be awarded.⁴⁵ While we tentatively conclude that simultaneous multiple round bidding is the most effective and efficient bidding design for the 37 GHz band, it is possible that another bidding method may be more appropriate for all licenses. Where there is less interdependence among licenses, there is also less benefit to auctioning them simultaneously.⁴⁶ When the values of particular licenses to be auctioned are low relative to the costs of conducting a simultaneous multiple round auction, we may need to consider auction designs that are relatively simple, with low administrative costs and minimal costs to auction participants. For example, with large numbers of low value licenses, we may decide that it is preferable to implement a low cost auction method such as single round sealed bidding to minimize cost and expedite the licensing process.⁴⁷ We may also wish to consider a single round of bidding in certain auctions where eligibility requirements limit participation to few bidders.⁴⁸ We additionally note that the presence of

⁴³ We adopted simultaneous multiple round auctions as the auction methodology for both broadband and narrowband licenses. Competitive Bidding Fifth Report and Order, 9 FCC Rcd 5532, 5544 (¶¶ 31-32) for broadband PCS and Competitive Bidding Third Report and Order, 9 FCC Rcd 2941, 2947-2949 (¶¶ 17-21) for narrowband PCS.

⁴⁴ See, e.g., Competitive Bidding Third Report and Order, 9 FCC Rcd 2941, 2946 (¶ 13).

⁴⁵ Id. at 2947 (¶ 15).

⁴⁶ Id.

⁴⁷ Id.

⁴⁸ Id.

incumbents on certain channels, such as exist in the 39 GHz band, could affect the relative desirability and value of otherwise identical licenses in ways we do not anticipate. We seek comments on any alternative bidding designs and their applicability as a competitive bidding method in the 37 GHz band.

33. Combinatorial Bidding. In general terms, combinatorial bidding allows bidders to bid for multiple licenses as "all or nothing" packages.⁴⁹ Combinatorial bidding can be implemented with either simultaneous or sequential auction designs.⁵⁰ While there are significant benefits associated with combinatorial bidding, especially in terms of efficient aggregation of licenses, we previously concluded that simultaneous multiple round auctions offer many of these same advantages without the same degree of administrative and operational complexity and without biasing auction outcomes in favor of combination bids.⁵¹ However, since simultaneous multiple round bidding may potentially prove to be our preferred auction method for awarding 37 GHz licenses, we tentatively conclude that combinatorial bidding will be unnecessary in most 37 GHz auctions. While 37 GHz licenses are likely to be worth more to some bidders as a part of a package, we believe that simultaneous multiple round bidding will provide these bidders with ample opportunity to express the value of interdependent licenses. Moreover, we tentatively conclude that there will not be any extreme discontinuity in value if some licenses in a package are not obtained.⁵² We believe that the opportunity to acquire licenses in after-market transactions and the ability to withdraw bids (upon additional payment) will limit the risks associated with failing to successfully acquire all of the licenses in a desired package.⁵³ In circumstances where we do not use simultaneous multiple round bidding, however, we may permit combinatorial bidding. We seek comment on these proposals and tentative conclusions.

c. Bidding Procedures

34. Grouping of Licenses. We determined in the Competitive Bidding Second Report and Order that in a multiple round auction, highly interdependent licenses should be grouped together and put up for bid at the same time because such grouping provides bidders with the most information about the pieces of complementary and substitutable licenses during the

⁴⁹ In combinatorial bidding, if a bid for a group of licenses exceeds the sum of the highest bids for the individual licenses that comprise the package, then the package bid would win. We may wish to institute a premium so that the combinatorial bid would win only if it exceeded the sum of the bids for individual licenses by a set amount.

⁵⁰ Competitive Bidding Third Report and Order, 9 FCC Rcd 2941, 2949-2950 (¶¶ 23-24).

⁵¹ Id.

⁵² Id.

⁵³ Id.

course of an auction.⁵⁴ We also determined that the greater the degree of interdependence among the licenses, the greater the benefit of auctioning a group of licenses together in a simultaneous multiple round auction.⁵⁵ Whether we use our preferred approach of a sequence of simultaneous multiple round auctions or sequential individual auctions, we must choose which licenses will be auctioned together. The importance of the choice of license groupings increases with the degree of interdependence among the individual licenses or groups of licenses to be auctioned. Grouping interdependent licenses together and putting them up for bid at the same time will facilitate awarding licenses to bidders who value them the most highly by providing bidders with information about the prices of complementary and substitutable licenses during the course of an auction.⁵⁶ Accordingly, we propose grouping 37 GHz licenses into the various simultaneous auctions by aggregating together those licenses exhibiting the greatest degree of interdependence so that there will be limited interdependence across groups.

35. Choosing which licenses to auction simultaneously requires a judgment about the degree of interdependence, i.e., the extent to which the amount bidders are willing to pay for one license depends on the price of another.⁵⁷ Licenses may be interdependent either because they are substitutes or because they are complements. With substitutes, the lower the price of one license, the less a bidder will be willing to pay for another. With complementary licenses, on the other hand, the lower the price of one license, the more a bidder will be willing to pay for another. This is true because generally complementary licenses are worth more as part of a package than individually.⁵⁸ For example, bidders are likely to be willing to pay more for two geographically contiguous 37 GHz licenses than two equivalent non-contiguous licenses, and a single bidder may be willing to pay more for the two licenses than would two separate bidders.⁵⁹

36. Based on the foregoing, we tentatively conclude that we will auction all 37 GHz licenses through a sequential series of simultaneous auctions. In each case, the licenses are complements as well as substitutes, and thus their values are highly interdependent. While we observe that, given the large number of licenses involved, it might be administratively impractical to auction all 37 GHz licenses together, we ask nonetheless whether the interdependencies among all 37 GHz licenses are sufficiently strong that we should make

⁵⁴ Competitive Bidding Second Report and Order, 9 FCC Rcd 2348, 2366 (¶¶ 106-107).

⁵⁵ Id. at 2363-2364 (¶¶ 89-94).

⁵⁶ See, e.g., Competitive Bidding Third Report and Order, 9 FCC Rcd 2941, 2951 (¶ 26).

⁵⁷ Id.

⁵⁸ Id.

⁵⁹ Id.

every effort to have a single 37 GHz auction. We also specifically solicit comments on alternative license groupings and ask bidders to explain how such groupings would benefit bidders.

37. Bid Increments. As with the rules we adopted for previous multiple round auctions for other services, we propose to establish minimum bid increments for bidding in each round of the auction, based on the same considerations in our prior orders.⁶⁰ Where we use simultaneous multiple round auctions, it is important to specify minimum bid increments. The bid increment is the amount or percentage by which the bid must be raised above the previous round's high bid in order to be accepted as a valid bid in the current bidding round.⁶¹ The application of a minimum bid increment speeds the progress of the auction and, along with activity and stopping rules, helps to ensure that the auction comes to closure within a reasonable period of time.⁶² Establishing an appropriate minimum bid increment is especially important in a simultaneous auction with a simultaneous closing rule. In that case, all markets remain open until there is no bidding on any license and a delay in closing one market will delay the closing of all markets.⁶³

38. We propose to announce by public notice prior to auction the specific bid increment that will be used. We anticipate starting the 37 GHz auction with relatively large bid increments, and adjusting the increments as bidding activity dictates.⁶⁴ Because we propose to use simultaneous multiple round auctions for most 37 GHz licenses, we believe that it is necessary to impose a minimum bid increment to ensure that the 37 GHz auctions conclude within a reasonable period. We believe that it is important in establishing the amount of the minimum bid increment to express such increment as both a percentage of the high bid from the previous round and as a fixed dollar amount per megahertz per service area population (MHz-pops), whichever is greater. This will ensure a timely completion of the auction even if bidding begins at a very low dollar amount.⁶⁵ We also propose to retain the discretion to vary the minimum bid increments for individual licenses or groups of licenses at any time before or during the course of the auction, based on the number of bidders, bidding activity, and the aggregate high bid amounts. We propose to retain the discretion to keep an auction open if there is a round in which no bids or proactive waivers are submitted, as discussed in ¶¶ 39-48, infra. We seek comment on these proposals.

⁶⁰ Id. at 2953 (¶¶ 30-32).

⁶¹ Id. at 2953 (¶ 30).

⁶² Id.

⁶³ Id.

⁶⁴ Id.

⁶⁵ Id. at 2953 (¶ 31).

39. Stopping Rules for Multiple Round Auctions. In multiple round auctions, a stopping rule must be established for determining when the auction is over.⁶⁶ Three types of stopping rules exist that could be employed in simultaneous multiple round auctions: markets may close individually, simultaneously or a hybrid approach may be used.⁶⁷ Under a market-by-market approach, bidding closes on each license after one round passes in which no new acceptable bids are submitted for that particular license. With a simultaneous stopping rule, bidding remains open on all licenses until there is no bidding on any license.⁶⁸ Under this approach, all markets will close if a single round passes in which no new acceptable bids are submitted for any license. Using a hybrid approach, we may use a simultaneous stopping rule, along with an activity rule designed to bring the markets subject to the simultaneous stopping rule to a close within a reasonable period of time, for the higher value licenses. And for lower value licenses, where the loss from eliminating some back-up strategies is less, we may use simpler market-by-market closing. Such a hybrid approach might simplify and speed up the auction process without significantly sacrificing efficiency or expected revenue.⁶⁹ We propose announcing by Public Notice before each auction the stopping rule that we will use. We seek comments on the various options for stopping rules and ask commenters to address which rules would be optimal for simultaneous multiple round auctions of licenses in the 37 GHz band.

⁶⁶ Competitive Bidding Fifth Report and Order, 9 FCC Rcd 5532, 5550-5552 (¶¶ 46-49); Competitive Bidding Third Report and Order, 9 FCC Rcd 2941, 2954-2955 (¶¶ 33-35); see also Amendments of Parts 2 and 90 of the Commission's Rules to Provide for the Use of 200 Channels Outside the Designated Filing Areas in 896-901 MHz and 935-940 MHz Bands Allocated to the Specialized Mobile Radio Pool, Implementation of Section 309(j) of the Communications Act -- Competitive Bidding, and Implementation of Sections 3(n) and 322 of the Communications Act, PR Docket No. 93-25, GN Docket No. 93-252, Second Report and Order and Second Further Notice of Proposed Rule Making, 10 FCC Rcd 6884 (1995)(900 MHz Second Report and Order) at ¶¶ 81-83; see also Amendment of Parts 21 and 74 of the Commission's Rules with Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service, Report and Order, MM Docket No. 94-131, PP Docket No. 93-253, FCC 95-230 (June 30, 1995) at ¶¶ 114-123 (MMDS Report and Order).

⁶⁷ Competitive Bidding Third Report and Order, 9 FCC Rcd 2941, 2954 (¶ 33); see also 900 MHz Second Report and Order at ¶ 81.

⁶⁸ This approach has the advantage of providing bidders full flexibility to bid for any license as more information becomes available during the course of the auction, but it may lead to very long auctions, unless an activity rule is imposed. Furthermore, such a stopping rule may be vulnerable to strategic delay by bidders seeking to impede closure of the auction.

⁶⁹ See, e.g., Competitive Bidding Third Report and Order, 9 FCC Rcd 2941, 2954 (¶ 33).

40. In the event we adopt a simultaneous stopping rule, we propose to retain the discretion to declare at any point in a simultaneous multiple round auction that the auction will end after one additional round or some other specified number of additional rounds. This will prevent bidders from strategically delaying an auction by bidding on one license in order to delay the closing of bidding on all licenses.⁷⁰ This proposal would also ensure ultimate Commission control over the duration of the auction. Moreover, we tentatively reserve the discretion to vary the duration of bidding rounds or the interval at which bids are accepted (e.g., run two or more rounds per day rather than one), in order to move the auction toward closure more quickly.⁷¹ If this mechanism is used, we would most likely shorten the duration and/or intervals between bidding rounds where there are relatively few licenses to be auctioned, where the value of the licenses is relatively low or in early rounds to speed the auction process. Where license values are expected to be high or where large numbers of licenses are being auctioned, we propose increasing the duration and/or intervals between bidding rounds.⁷² We would announce by Public Notice, and may vary by announcement during an auction, the duration and intervals between bidding rounds. We seek comment on these proposals.

41. Activity Rules. In order to ensure that simultaneous auctions with simultaneous stopping rules close within a reasonable period, we believe that it may be necessary to impose an activity rule to prevent bidders from waiting until the end of the auction before participating. Because simultaneous stopping rules generally keep all markets open as long as anyone wishes to bid, they also create an incentive for bidders to hold back until prices approach equilibrium before making a bid and risking additional payment for withdrawing.⁷³ As noted above, this could lead to very long auctions. An activity rule is less important when markets close one-by-one because failure to participate in any given round may result in losing the opportunity to bid at all, if that round turns out to be the last.

42. In the Competitive Bidding Second Report and Order, we adopted the Milgrom-Wilson activity rule as our preferred activity rule where a simultaneous stopping rule is used.⁷⁴ We have subsequently adopted or proposed the Milgrom-Wilson rule in each of our

⁷⁰ Id. at 2955 (¶ 35).

⁷¹ Id.

⁷² Id.

⁷³ Id. at 2955 (¶ 36); see also 900 MHz Second Report and Order at ¶ 83.

⁷⁴ Competitive Bidding Second Report and Order, 9 FCC Rcd 2348, 2371-2373 (¶¶ 135-145).

simultaneous multiple round auctions.⁷⁵ The Milgrom-Wilson approach encourages bidders to participate in early rounds by limiting their maximum participation to some multiple of their minimum participation level.⁷⁶ Bidders are required to declare their maximum eligibility in terms of MHz-pops, and make an upfront payment equal to a dollar amount per MHz-pops (e.g., \$0.02 per MHz-pops).⁷⁷ That is, bidders will be limited to bidding on licenses encompassing no more than the number of MHz-pops covered by their upfront payment.⁷⁸ Licenses on which a bidder is the high bidder from the previous round, as well as licenses on which a new valid bid is placed, count toward this MHz-pops limit. Under this approach, bidders will have the flexibility to shift their bids among any licenses for which they have applied so long as the total MHz-pops encompassed by those licenses does not exceed the number for which they made an upfront payment. Moreover, bidders will be able to secure the freedom to participate at whatever level they deem appropriate by making a sufficient upfront payment. To preserve their maximum eligibility, however, bidders would be required to maintain some minimum activity level during each round of the auction.

43. Under the Milgrom-Wilson proposal, the minimum activity level, measured as a fraction of the self declared maximum eligibility, will increase during the course of the auction. For this purpose, Milgrom and Wilson divide the auction into three stages.⁷⁹ During the first stage of the auction, a bidder is required to be active on licenses encompassing one-third of the MHz-pops for which it is eligible. The penalty for falling below that activity level is a reduction in eligibility.⁸⁰ At this stage, bidders would lose three MHz-pops in maximum eligibility for each MHz-pops below the minimum required activity level. In other words, each bidder would retain eligibility for three times the MHz-pops for which it is an

⁷⁵ See 900 MHz Second Report and Order at ¶ 88-90; see also Competitive Bidding Third Report and Order, 9 FCC Rcd 2941, 2955-2957 (¶¶ 36-40); see also MMDS Report and Order at ¶¶ 114-123.

⁷⁶ See, e.g., Competitive Bidding Third Report and Order, 9 FCC Rcd 2941, 2958 (¶ 37).

⁷⁷ See discussion of upfront payments at ¶ 54, *infra*.

⁷⁸ *Id.*

⁷⁹ The auction would move from stage one to stage two when, after three rounds of bidding, the high bid has changed on five percent or fewer of the licenses (measured in terms of MHz-pops) being auctioned. Stage three would begin when the high bid has changed on two percent or fewer licenses (measured in terms of MHz-pops) over three rounds. We retain the discretion to modify this method and announce such modification by Public Notice. See, e.g., Competitive Bidding Third Report and Order, 9 FCC Rcd 2941, 2956 n.16.

⁸⁰ See, e.g., Competitive Bidding Third Report and Order, 9 FCC Rcd 2941, 2956 n.16.

active bidder, up to the MHz-pops covered by the bidder's upfront payment.⁸¹ In the second stage, bidders are required to be active on two-thirds of the MHz-pops for which they are eligible. The penalty for falling below that activity level would be a loss of 1.5 MHz-pops in eligibility for each MHz-pops below the minimum required activity level. In the third stage, bidders are required to be active on licenses encompassing all of the MHz-pops for which they are eligible.⁸² The penalty for falling below that activity level is a loss of one MHz-pops in eligibility for each MHz-pops below the minimum required activity level. Each bidder thus retains eligibility equal to its current activity level (1 times the MHz-pops for which it is an active bidder). We seek comment on this proposed activity rule.

44. Finally, to avoid the consequences of clerical errors and to compensate for unusual circumstances that might delay a bidder's bid preparation or submission on a particular day, we propose permitting each bidder to request and automatically receive a waiver of the activity rule once every three rounds.⁸³ In the Competitive Bidding Fourth Memorandum Opinion and Order, we stated that the Commission retained the discretion to modify the method and timing of submitting waivers and to allow for two types of waivers - "proactive" and "automatic."⁸⁴ As explained therein, proactive waivers invoked in a round in which there are no new valid bids will keep an auction open, while an automatic waiver submitted in a round in which no other bidding activity occurs will not keep an auction open.⁸⁵ Proactive waivers are submitted by the bidder, while automatic waivers would be submitted automatically for a bidder whenever a bidder's eligibility would be reduced because of insufficient bidding activity and a waiver is available unless the bidder specifically chooses not to have the automatic waiver apply.⁸⁶ Automatic activity rule waivers would be automatically applied by the bidding system in any round where a bidder's activity is below the requested activity level as long as the bidder has waivers remaining.

45. Under this proposal, we would announce by Public Notice how many waivers bidders would receive. A waiver would permit a bidder to maintain its eligibility at the same level as in the round for which the waiver is applied. A waiver, however, could not be used to correct an error in the amount bid. This would ensure that bidders are not arbitrarily

⁸¹ Id. at ¶ 38.

⁸² Id.

⁸³ Id.

⁸⁴ Competitive Bidding Fourth Memorandum Opinion and Order, 9 FCC Rcd 6858, 6861 (¶ 15).

⁸⁵ Id.

⁸⁶ Id.